1984 MAC Safety Awa
THE MAC TROPHY FOR FLYING SAFETY

THE MAC Flyer

For Greater Safety in MAC Air Operations

March 1985 | MACRP 127-5 | VOL XXXII NO. 3

Gen Thomas M. Ryan, Jr. Commander in Chief
Brig Gen William H. Sistrunk Inspector General
Col John G. Stephen Director of Safety

Maj James M. Lee Supervising Editor
Capt Byron L. Howard Associate Editor
Capt Thomas J. Whitmire Associate Editor
Capt Donald L. Rosenberry Associate Editor
Frances A. Caldwell Managing Editor
Tom O'Laughlin Art Director

page 8

page 25

About The Cover: The MAC Trophy for Flying Safety

Features

3 Go Ahead—Make My Day!
Write *now* or forever hold your quill!

4 A Question of Complacent Responsibility
How do you spell "in command?"

8 Crewmember Injuries
A *painful* look at inflight injuries.

11 One Piece of the Crew Coordination Puzzle
The human relations connection.

14 Toxicological Testing
Why test me!?

16 1984 MAC Safety Awards
The best of the best.

18 *TMF* Instrument Quiz
What's your *ICAO* IQ?

25 C.R. Terror
The Forgetful Flyboy Freezes Up.

Departments

10 Flying Hour Milestones

20 Mishap with a Moral

24 Deja Vu

28 Quick Stoppers

31 After Deadlines

The MAC Flyer is published by the Director of Safety, Military Airlift Command. The contents are informative and not regulatory or directive. Names of people and places in mishap stories are representative and not necessarily of the aircraft or equipment involved. Information in any article may not be construed as incriminating under Article 31, UCMJ.

Contributions, comments and criticisms are welcome. Write: *The MAC Flyer*, HQ MAC/IGFE, Scott AFB, IL 62225-5101, or Autovon 638-3534. The editors reserve the right to make any editorial changes in manuscripts which they believe will improve the material without altering the intended meaning.

Subscriptions are available from: The Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes of address for subscription mailing should be sent to GPO. Give both old and new addresses, including zip codes. USAF Active and Air Reserve Forces units establish requirements for this magazine through their publication distributor (DAPD). Other U.S. Military units should consult administrative directives. *The MAC Flyer* is published at an approximate ratio of one magazine for every five MAC aircrew members, and one for every twenty MAC Support personnel. Distribution X; OPR: HQ MAC/IGFE ISSN 0024-788X.

Go Ahead—Make My Day!

Yeah, yeah. I know. Things are tough all over. But last November, when the editors of this "esteemed" publication began advertising the 1985 Flight Safety Writing Contest, you had practically "forever" to enter. And all you had to do was write us a poem or story with a flying safety or mishap prevention theme. Simple, huh? But that was five months ago, and the editors are tired of being nice persons. That's why they hired *me!* So listen up. This is your last warning.

If I were you, I'd start composing your safety masterpiece right away, if not sooner. You only have until midnight 31 March to postmark your entry, which leaves even less time than you had before you started reading this little treatise. The longer you wait, the greater my chances are to "fulfill" my, er, contract. Get it? So, you'd best put pen to paper or fingers to keyboard—your choice—and finish whatever you started writing. Or start writing from scratch. I have it on good authority the editors will accept any legible, coherent entry, whether it's typed or word-processed. And they'll also send you a free C.R. Terror T-shirt just for entering.

If you still don't care to enter, that's okay. Just fine. *Click!!* Go ahead—*make my day!*

The Rules

The 1985 MAC Flying Safety Writing Contest is conducted according to MACR 900-3 and these rules. All entries must be original, unpublished and postmarked no later than 31 March 1985. Stories must be between 1,000 and 3,000 words long (about 6 to 14 double-spaced typed pages); poetry should be about 75 to 100 lines. Entries must contain an *aviation safety/mishap prevention message*. Manuscripts must be double-space typed and submitted in two copies. Identify entries by title only and attach a cover sheet showing the author's name, address, duty phone number and unit. Also, the cover sheet should contain a brief autobiography.

The contest is open to anyone. Entries qualifying under the above rules earn their author a free C.R. Terror T-shirt (so indicate your size) and a free 1-year subscription to *The MAC Flyer*. However, contest prizes (desk sets and plaques) may only be awarded to military members and civilian employees of the Department of the Air Force or Air Reserve Forces. Other entrants may be selected for Honorable Mention in a Special Category. All winning stories will be published in *The MAC Flyer*. Entries should be addressed to:

Safety Writing Contest
HQ MAC/IGFE
Scott AFB, IL 62225-5101

A Question of Complacent Responsibility

Taxi incidents may be hazardous to your ego's health

by Capt. James Zazas
39th Tactical Airlift Squadron
Pope AFB , NC

Capt. Michael Adams surveyed the anxious crowd before him. They came to hear a lot that day, two weeks before Christmas. The audience was filled with expectation. This commander's call was guaranteed to be enlightening.

Captain Adams knew many in the room were thinking of spending Christmas with family and friends. He knew others were concerned about completing training requirements before the year was over. He also knew many had to fly more missions before they could enjoy their hard-earned vacations. Finally, he knew the hearts and minds of several crewmembers were already miles away from the base. The mood was perfect for his message.

"Gentlemen," he began softly, "I was involved in a taxiing incident two weeks ago."

Captain Adams turned around and pushed away a large, sliding panel to reveal a blackboard. On it was a diagram showing the parking ramp where the wing had conducted a recent exercise.

"And as I talk about this incident, ask yourselves why I bumped my airplane into another."

"Whew! What a day!" Captain Michael Adams eased his six-foot frame into the Hercules' left seat for the fourth time that day. Casting a glance at his copilot, he added, "You know something, Terry? I've been with this operation since the start and I love it! But, oh, how I miss the excitement of the first week."

First Lieutenant Terry Wilson nodded his head in agreement. He knew the first week of an exercise was always the best, the most exhilarating *and* the most dangerous. Now, four weeks later, there were only the usual, casually scheduled shuttle missions to and from the island. What had started as a full blown wargame with thirty C-130s and C-141s flying countless sorties day and night had withered to three Hercules aircraft begging to be flown. All the crews had gone home except for a lucky few who stayed to fly the last missions.

"Come on you guys! The navigator, Capt. Bill Thomas added, "Be thankful for the experience. I'm sure a thousand airlifter pilots wish they were in your shoes."

"You're right, nav," Captain Adams agreed. Come on, gang. Let's fly this puppy home and put it in the barn. Tomorrow is Thanksgiving—Caribbean style."

Lieutenant Wilson cringed, then looked skyward. "Please let it be a real turkey, not a C-ration."

The brown and green C-130 moved smoothly through the vast, Caribbean sky. The drone of the Allison engines relaxed the five weary crewmembers. Each daydreamed

Honorable Mention Winner, 1984 MAC Flying Safety Writing Contest

of family, friends, and the delicious feast-to-be back home.

Second Lieutenant Robert Harris paced the floor impatiently. He wished the last shuttle for the day was back. As maintenance supervisor, he had the responsibility of making sure the C-130s were always ready to fly, all three of them. With the last C-130 still out, he was missing a super pre-Thanksgiving bash on the beach. Tomorrow he could sleep the day away; it was a holiday.

Lieutenant Harris scanned the bleak, empty terminal building around him. What had been a thriving community of various military units and civilian agencies competing for precious space was now a deserted shell, except for his small maintenance group in one end and a few security police in the other. His maintenance staff was a skeleton of what it had been four weeks before. The most experienced crew chiefs and maintenance technicians, originally scheduled to stay until the exercise's completion, had been sent home to support other "real world" commitments. Lieutenant Harris knew his turn to rotate home would come soon.

"Sir?" An airman walked over to Harris. "Do you really need us all here to marshal the bird? We don't need six guys to do the job of three."

Lieutenant Harris looked at the airman carefully. He was right. "Ah, go on home and take your buddies. I'll park the bird on spot three," he said. Then he added confidently, "I'll cover for you."

"Gee, thanks, sir!" the airman exclaimed. Then, as an afterthought he added, "By the way, the bird on spot two is 20 or so feet off center."

Lieutenant Harris never heard the last comment. His mind, too, was on the Thanksgiving party.

The C-130 was 20 minutes away from landing at the forward operating base. The navigator relayed the arrival time, cargo load and maintenance status to the Tactical Airlift Control Element, or TALCE. In turn, TALCE relayed that information to maintenance.

Lieutenant Harris was elated. He was going to make the party after all. The aircraft was Alpha-1 and empty. He gathered a pair of lighted wands and headed outside to the poorly-lighted ramp to greet the Hercules. Along the way, he grabbed the two remaining maintenance folks to help him marshal the bird. Only one had a pair of wands that worked.

The Herk cleared the taxiway and Lieutenant Harris waved his wands to attract the pilot's attention. The C-130 turned towards him. Arms over his head, Harris signaled the aircraft to advance. Glancing behind, he saw somebody at the TALCE module wave frantically to catch his attention.

"Sergeant!" Lieutenant Harris called against the din of the engines. "Get over here and put this bird on spot three."

"Yes sir!" the tee-shirted sergeant replied while accepting the wands. Lieutenant Harris ran across the ramp to the TALCE module.

Captain Adams peered intently into the semi-darkeness ahead. He could see the lighted wands of a marshaler at his ten o'clock position. He also saw a figure run across the ramp towards his three o'clock position.

"Okay, gang. We're legal. Nothing is on the left, one Herk on the right. Let's put this bird away and go home. We've done it 20 times before. You ready to reverse taxi, load?"

"Yes sir. Loadmaster is ready. I have my marshaler. Come on back. That's fine...turn towards four..."

Slowly the Hercules moved backwards. To put the aircraft on the spot, the marshalers had to guide the large turboprop through some unusual angles. The copilot scanned carefully to the right, but the shadows made it very difficult.

"Keep it coming...keep it coming...doing fine." The loadmaster continued his banter. "Turn towards number...one...that's fine..."

"Looks good...clear right." the copilot added.

Lieutenant Harris glanced outside through the thick glass of the TALCE trailer. His phone call was taking longer than he expected, but no matter; his guys were doing a good job without him. Suddenly, his skin began to crawl. He wanted to scream, but couldn't.

The Hercules shuddered.

"Oh, no! I think I've hit something." Captain Adams took the four throttles out of reverse and into ground idle. "We're stopping!"

Like a sledgehammer on a spike, the truth hit home.

"Keep coming back...What?!"

The forward marshaler continued to signal the aircraft to reverse. Captain Adams gave the marshaler a crossed arms signal to relay his intentions to stop. The forward marshaler put his wands down and walked to a spot 30 feet directly in front of the aircraft. He then started to signal the aircraft to move forward.

"We're stopping! I think we've run over some chocks!" Captain Adams was emphatic. "Engineer, you're cleared out to see what we hit."

The shaken captain loosened his shoulder harness. He leaned forward and glanced across the ramp to the C-130 on the copilot's side. A pit formed in his stomach. Like a sledgehammer on a spike, the truth hit home. It wasn't chocks he had hit—it was the C-130 on spot two.

The flight engineer came back on the flight deck. The sick look in his eyes confirmed everybody's worst fears. Two birds were now bent.

"TALCE, TALCE, Sage 36." Captain Adams said, summoning all his courage to sound professional. "Could you send the

COMALF or the senior duty controller out to the aircraft?"

Thanksgiving was indeed one of thankfulness, but not around a table filled with food and friends. Instead the day was spent seated across from a wing safety representative who had flown down from home base only hours before.

Minutes dragged into hours as each crewmember and marshaler had his turn to describe what happened. The investigator was thankful that no one was hurt. The aircrew and maintenance folks were thankful the actual physical damage was slight. After some minor repairs, both aircraft were mission ready. The real damage was to the crew's morale and Thanksgiving spirit.

"Gentlemen, who was responsible?" Captain Adams stepped back from the blackboard and added, "Who was ultimately responsible?" The audience was transfixed, totally speechless. The captain continued. "No answer? Come on now. I'll show you who was responsible." Reaching to the segmented blackboard once again, Captain Adams revealed another section. A large, block letter "D" was drawn upon it. "Anybody see this before? I hope so. Everyday you fly. Where? On the flight orders! Aircraft commanders, what does it mean?"

The crowd stirred, but no one volunteered an answer.

Captain Adams raised his voice. "It means simply—IN COMMAND! Gentlemen, I had the 'D' next to my name down there on that island. I was the one with my hands on the throttles and nose wheel steering. I was the one with my feet on the pedals. Granted, I had a lot of help backing my airplane into the other one. However, who was ultimately responsible? I was! I possessed the 'D.'"

The crowd was restless. Many were uneasy from what they had just heard. Captain Adams recognized this fact. Now was the time for another powerful punch.

"Why did I back my aircraft into another?" Captain Adams stared intently at his crowd. The audience was silent.

"Why? Because I was doing too much preholiday dreaming and not enough C-130 flying. Backing the Herk so many times under adverse conditions made it routine, a habit, even second nature. Ol' Murphy realized this fact, and he reached out and got us. We were complacent!"

Captain Adams looked around the room. All eyes were on him; all ears directed at him. Captain Adams smiled. He knew his safety message would remain in their thoughts. "Gentlemen, the holiday season is here once again. Many of you will rush to finish various training requirements. Many of you will fly the same routes a dozen times in the next two weeks to complete these requirements. You may consider taking shortcuts to get the job done. Don't! Because of the routine: same altitude, same turn points, same drops zones, you may become complacent. Don't! Work together to get the job done. Daydream about your holiday after the mission. If you do, we all can enjoy a festive time.

The crowd nodded their approval. Captain Adams was pleased. He had driven his message home.

"Fly safe...Fly alert and above all, retain command. If you don't take command, and keep it, Murphy will, and you may not be as fortunate as I was."

ABOUT THE AUTHOR

Capt. James Zazas is a 1977 graduate of DePauw University where he was commissioned through AFROTC. After completing UPT at Columbus AFB, he was assigned to Pope AFB and is now a C-130 aircraft commander.

Crewmember Injuries

Things That Go Bump in the Flight

Multiple lacerations, rope burns, assorted bruises, abrasions, and a wide variety of broken bones.

Does that list sound like part of the script from TV's latest "detective-action" show? How about the results of Super Bowl XIX or the roller derby playoffs? None of the above, you say? Correct! All the above injuries (only a part of the total) occurred in the cargo compartments of MAC's strategic and tactical airlifters over the past two years and involved both crewmembers *and* passengers. Interestingly, these injuries occurred during all phases of flight from ground operations to cruise. To grasp the significance of the problem, let's review a few of the incidents which resulted in injuries.

- A loadmaster received severe lacerations to his leg when he brushed against the fender of an M721 trailer while moving through the cargo compartment in flight.
- An aircrew was dropping training bundles when a deployment line whipped back into the cargo compartment and wrapped itself around the loadmaster's neck. Quick action by a flight examiner loadmaster prevented serious injury.
- Another loadmaster was walking around in the cargo compartment during descent. He was carrying a walk-around bottle in one hand and a checklist in the other, and suffered bruised ribs when he fell.
- A C-130 experienced an uncommanded elevator input during cruise. An unrestrained loadmaster was knocked unconscious and received multiple abrasions as a result of being thrown about by the abrupt maneuver.
- Shortly after takeoff, a loadmaster was walking around the cargo compartment completing his after-takeoff checklist. When the aircraft encountered a strong downdraft, the loadmaster was knocked to the cargo

he passed out and fell, striking his head. It took three stitches to close the cut above his eye.

More distressing than the number and severity of these injuries, many could have been prevented. As crewmembers, we must be aware of the hazards involved in moving around inside the aircraft during all phases of flight. Equally important, we must make sure our passengers are thoroughly briefed on these hazards as well. The following suggestions might be useful in preventing future injuries to your crew or your passengers.

1. When seated in an aircraft during ground or flight operations, keep seat belts/shoulder harnesses securely fastened.
2. Minimize unnecessary aircrew and passenger movement inside the aircraft during flight.
3. If required to move around inside the aircraft to perform your duties, keep the rest of the crew informed and use extra caution.

compartment floor and suffered a bruised hip and shoulder, as well as sustaining a cut above his eye.

- Walking forward in the cargo compartment during cruise, a loadmaster lost his balance and fell, fracturing his ankle in the process.
- During a Red Flag mission, the pilot executed an abrupt evasive maneuver causing a loadmaster to fall and break his leg.
- Another loadmaster was injured during a Red Flag evasive maneuver when he lost his grip and was thrown to the floor of the aircraft. He suffered injuries to his head, back and shoulder.
- During engine start, the pilot failed to set the parking brake. As the aircraft began to roll forward, the left-seater abruptly applied brakes. The sudden stop threw a loadmaster backwards, fracturing two of his ribs.
- A passenger was standing in the cargo compartment during flight when

Flying Hour Milestones

CMSgt Oris E. Basher, Jr., 8 MAS
SMSgt William O. Brown, 8 MAS
MSgt John J. Warren, 728 MAS

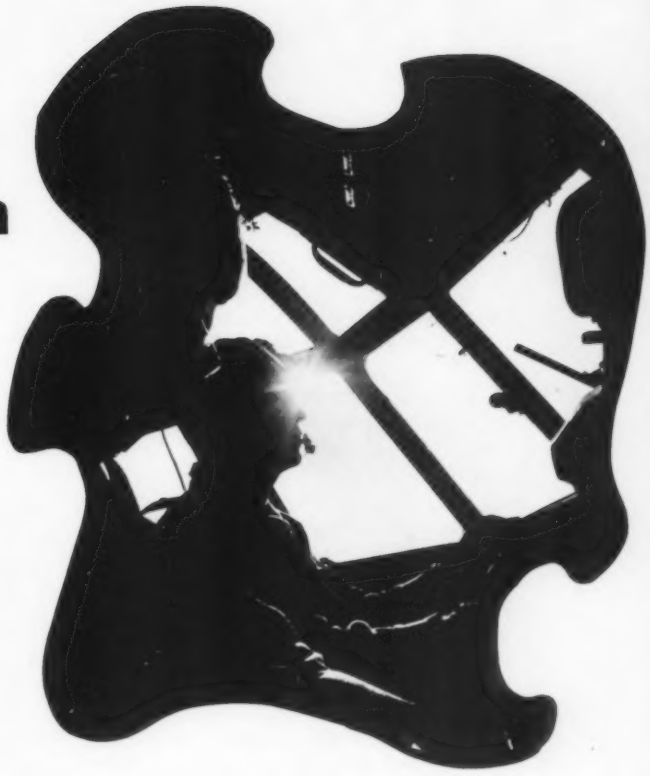
Col John D. Butterfield, 463 TAW/CC
Lt Col Ronald L. Edminston, 16 TATS
Lt Col David E. Mullen, 304 ARRS
Lt Col John S. Rutter, 8 MAS
Lt Col Robert E. Snyder, 16 TATS
Lt Col Robert B. Stephens, 701 MAS
Maj Michael E. Ankenbrandt, 95 TAS
Maj John F. M. Bauer, 6 MAS
Maj Richard W. Burke, Jr., 440 TAW
Maj George Fondren, Jr., 183 TAS
Maj Phillip M. Friday, 193 SOG
Capt William G. Wade, 728 MAS
SMSgt Allen D. Kapp, 193 SOG
SMSgt Fred C. Sommer, 139 TAS
SMSgt Norman C. Swanson, 728 MAS
MSgt Herbert E. Daniel, 76 MAS
MSgt Morgan E. Davis, 8 MAS
MSgt Robert P. Dean, Jr., 8 MAS
MSgt Stephen Gates, 337 TAS
MSgt Joseph L. Gervasio, 95 TAS
MSgt Charles D. Jones, 86 MAS
MSgt Sam Lorino, Jr., 301 ARRS
MSgt Roger E. Miller, 41 MAS
MSgt Garry A. Quick, 139 TAS
MSgt Curtis R. Smock, 86 MAS
MSgt Dennis W. Stoneman, 16 TATS
MSgt Robert Tanguay, 16 TATS
TSgt Michael S. Bryan, 57 MAS
TSgt Ronald M. Carroll, 8 MAS
TSgt J. D. Heckmaster, 16 TATS
TSgt Shelton Jones, 6 MAS
TSgt Elmer L. Roberts, 57 MAS

Maj Calfort M. Brownlee, Det 2, 67 ARRS
Maj Pinar Crane, Jr., 304 ARRS
Maj Dennis J. Eflein, Det 7, 37 ARRS/CC
Maj Clinton W. Hyde, 304 ARRS
Maj Waldo F. Libby, 304 ARRS
Maj William D. Peden, 304 ARRS
Maj John M. Poorman, 304 ARRS
Maj Michael K. Sullivan, 304 ARRS
Capt Robert G. Mignard, Det 2, 67 ARRS
Capt Edward K. Saffer, 304 ARRS
Capt John R. Tapp, 1550 FTS

Ranks and units are those at time of award. See MACR 900-3 for details on how to apply for your own milestone award.

Human Relations...

One Piece of the Crew Coordination Puzzle



by Captain Thomas J. Whitmire
Associate Editor

It's hard to hear the words "crew coordination" without sparking mental images of a copilot dutifully challenging crewmembers for correct checklist responses. Of course, checklist completion is an essential part of safe aircraft operation, but it's professionalism, *not* crew coordination, which dictates this action. Crew coordination runs a bit deeper, it's more intangible than the cut-and-dried action of checklist completion. Coordination involves bringing a group into a common action, movement, or condition in a smooth, concerted way. It's a function of how well we, as crewmembers, interact with one another. The way we give and take praise or criticism sets the tone for crew interaction. How we react when the pilot gets 200 feet off assigned altitude, the flight engineer incorrectly sets the fuel panel, or the navigator reaches the ADIZ exactly on course and exactly on time has a direct impact on the performance of that crewmember for the remainder of the mission. Assuming how well we interact as individuals determines how well we function as a crew, we'd be wise to give thought to obstacles which may prevent us from interacting as well as we could. A review of crew leadership, individual social style and individual behavior with emphasis on actions which may serve as roadblocks to crew interaction might help.

Crew Leadership

The *formal* leader of every crew is the aircraft commander and he or she is *always* the final authority regarding aircraft operation. But often there's another crewmember who acts as the *informal* leader, usually a senior crewmember with many years in the cockpit. The individual may or may not be desirous of the position, but if the other crewmembers look to him or her as the informal leader, then it is so. Young aircraft commanders occasionally face this as they attempt to "prove" themselves as competent leaders. Often, the AC recognizes that the crew is looking to someone else for leadership and guidance. This causes frustration and may lead to competition with the informal leader for the crew's respect, which further isolates the AC from the crew.

In reality, the AC's task as formal leader is simple. The prudent AC will gain the support of the informal leader, realizing this person is the key to leading the rest of the crew. Gain the support of the informal leader and you gain the support of the crew. A pitfall here is the AC must realize the

process which is taking place and not be offended by it. It's a normal process and often occurs within groups. As the new AC gains experience and establishes a reputation, he or she will probably assume the informal leadership role as well. Additionally, the AC must not allow the informal leader to take him or her down a primrose path. Gaining the support of the informal leader does *not* mean allowing that person to make decisions reserved for the aircraft commander. Remember, it's the AC's decision and the AC's responsibility. Don't get blind-sided.

Individual Social Styles

According to psychologists David W. Merrill, Ph.D., and Roger H. Reid, in their book, *Styles and Effective Performance*, published in 1981, there are four social styles: the *driver*, the *amiable*, the *expressive* and the *analytical*. The basis for determining these four styles is assertiveness level and emotional level. Because we're all unique, it's rare to find anyone who fits precisely into one of the four types. Most of us have a social style made up of a combination of styles, and we tend to shift back and forth under different circumstances. We interact more smoothly with certain styles than with others. A review of the styles might help explain why there are certain people with whom we just can't seem to get along.

The driver, as the name implies, is an assertive, unemotional person, quick to make a decision. Since drivers are more goal oriented than people oriented, they often seem cold and indifferent. People are often afraid to give drivers bad news for fear of their reaction. They aren't likely to get "stepped on" without reacting. People with this social style might do well running an assembly line, but would likely have trouble acting as the boss of an art department.

At the other end of the emotion and assertiveness scale is the amiable. Amiables are non-assertive and very emotional. They are easy to work for, but have difficulty making decisions. They often change their minds rather than taking a position and sticking with it. As the name implies, the amiable is everyone's friend. You don't go into an amiable's office without going through a process of idle conversation before getting down to business. If you ask an amiable how the weekend went, be prepared to stay a while and listen. Drivers and amiables, being opposites, often have difficulty relating to each other through no fault of their own.

Equally strained is the relationship between the expressive and the analytical. Expressives are assertive like drivers, but unlike drivers, they are very emotional. Expressives, driven by emotion, are great ones for starting a project, working tirelessly for a period of time, and then losing interest and moving on to something else, often leaving the project unfinished. Expressives appear warm and approachable but are very competitive. They always want to be the center of attention. They tend to make mistakes because their decisions are based on feelings and hunches rather than on facts. Expressives are influenced by emotional appeal rather than by logical argument. An expressive might work well as head of the sales department, but would probably have difficulty leading the computer section. A more suitable choice to lead the computer section might be an analytical.

The analytical is non-assertive, unemotional, and very slow and methodical in making decisions. They easily get bogged down in information and facts, often missing deadlines. Analyticals, like drivers, are cold and indifferent to others. The analytical, being unemotional, is only swayed by an argument based on data and information rather than emotion. They are very slow to show warmth or friendship. The expressive, being emotionally charged, often has difficulty relating to the unemotional analytical.

Perhaps a better understanding of our differences will lead to smoother interaction and improve the way we behave when working with someone possessing an "opposite" social style.

Behavior

According to Robert Bolton, Ph.D., in his book, *People Skills*, written in 1979, there are three types of behavior which an individual may display while interacting with others. These are: *aggressive*, *submissive*, and *assertive*.

The aggressive crewmember may speak loudly or act in a rude or sarcastic manner to get the task accomplished with little regard for the feelings of others. They tend to

overpower the individuals around them. Although the task may get completed, individuals working with or for an aggressive flier may become resentful. They may, in fact, become unwilling to work in an effective manner with the offending crewmember. The other fliers certainly will not go out of their way to provide any extra assistance to that crewmember and the mission may suffer. Often, there's nothing the offended crewmembers would like better than to see the aggressive flier make a mistake and "get what they deserve." This is an extremely dangerous attitude for *anyone* on board an aircraft to harbor, and hopefully MAC crews are professional enough to fly with "Attila the Hun" and still cover his or her six if a mistake appears imminent, realizing the fate that awaits one crewmember often awaits the entire crew. The resentful feelings spawned by an aggressive crewmember may lead to a very dangerous environment in flight.

For a different reason, the submissive crewmember is equally dangerous. These types tend to bow to the needs of everyone else on the crew. Their goal in life is to totally avoid conflict and they are willing to bend as needed, all in the name of conflict avoidance. The submissive crewmember cares so much about the feelings of others that he or she often won't speak up even when it's obvious that someone has made or is about to make a mistake. It's easier for submissive crewmembers to do everything themselves rather than work with others and risk possible conflict. It may be difficult for them to make a decision for fear it will be incorrect and thus lead to conflict. Obviously, we need to strike a balance between these two extremes of behavior.

The last type of behavior is assertive. The assertive flier has the ability to get the task accomplished without abusing the feelings of other crewmembers. There's a tendency to confuse assertiveness with aggressiveness. The assertive crewmember always considers the needs and feelings of the other person. The aggressive crewmember, as mentioned earlier, has little or no regard for others' feelings. It's not what you do or say, but rather how you do it or say it. The aggressive flier resolves conflict in win-lose fashion. I win; you lose. On the other hand, the assertive flier resolves conflict in win-win fashion. This means the task gets accomplished and the feelings of the other crewmembers don't get "trampled" in the process.

In asserting yourself with an errant crewmember there are a few things to consider: 1) Focus on the offending crewmembers' behavior in a nonjudgmental way. Don't focus on the person's motives, attitudes, character and so on. 2) Be as specific as possible in describing the offensive behavior. If you don't accurately describe the offensive behavior, the offending crewmember will assume your assessment of his or her behavior is "out to lunch" and change is unlikely. 3) Clarify the concrete and tangible effects of the offending flier's behavior on the other crewmembers and mission accomplishment.

Despite the fact you're very careful in preparing and presenting your message to the offending crewmember, you may as well be prepared for a defensive reaction. This is normal, and hopefully the crewmember will realize that your goal is not a personal attack, but rather the enhancement of crew interaction. When this occurs, avoid letting the discussion degenerate into an argument.

The process of dealing with crewmembers' feelings and needs, coupled with the need to get the mission accomplished, is very time consuming. In times of crises, the feelings of others may have to be de-emphasized in order to meet an overwhelming need to achieve a common goal. The professional crewmember, hopefully, is able to recognize when the need arises and will come on line and become fully supportive of mission needs at the expense of his or her individual needs.

Crew coordination is one of those nebulous concepts which is difficult to address. Clearly, the way we interact has a direct impact upon how well we perform as a crew. While human relations is only one piece of the crew coordination puzzle, it is significant enough to warrant our special attention. Our awareness of the processes which are taking place certainly will not solve all our crew coordination problems, but may help us to better understand our personality and behavioral differences and may in turn help us work through them and lead to safer, more efficient aircraft operation.

Toxicological Testing:

Why test me!?

Capt Smedley, I'm your friendly neighborhood flight safety officer. The commander has directed a toxicology test. You can either accompany me, or go yourself, but either way you have to provide the hospital a specimen for analysis...."

Sound familiar? The requirement for toxicological testing following mishaps is a relatively recent development in the Air Force mishap prevention program. A revision to AFR 127-4 now requires automatic testing of

Reason, Rationale and Reality

all crewmembers and ground personnel involved in *every* Class A or B mishap. The regulation leaves it to the discretion of the commander as to whom shall be tested following Class C or Class D mishaps, with the guidance that individuals whose actions or inactions may have been factors in the mishap sequence are candidates for toxicological testing. It is important, from a philosophical point at least, to understand the origin of this requirement, the authority for its implementation, and how it is accomplished.

Most of us are familiar with the aircraft mishap aboard an aircraft carrier, the aftermath of which highlighted "substance abuse" among the aviation community. Senior defense officials viewed the use of non-prescription substances by fliers intolerable, and directed action to prevent such abuse. The age-old problem is how to identify the few who violate the rules. Given the ultimate goal, and considering some of the possible alternatives, tox testing after mishaps is fairly palatable. Once the decision to test following mishaps is made, the remaining question is: which mishaps warrant testing?

While crewmembers seem to accept testing following Class A or B mishaps, they grow irritated with the idea of testing after "minor" incidents, those which fall in the Class C or D categories. Closer analysis, though, shows the difference between a Class A and a Class D mishap to be only a matter of degree; the potential for human error or misjudgment is common to both. Viewed in this light, the fact that the decision-for tox testing after Class C and D mishaps is not automatic appears to be a demonstration of the inherent trust our leaders have for aviators and maintainers in general.

This does not appease all crewmembers, however, and there are some who feel these requirements single out the crew force for special scrutiny, as they don't see any support personnel being tested. This is simply not true. An examination of the method and frequency of testing for the non-crewmember would likely reveal the equality with which the program is administered. No simple task, considering the logistics involved. In the case of random testing, there is usually no difficulty in determining the source or rationale for the decision to implement.

The same cannot often be said for the test administered after a mishap. A frequent question is: Why's the safety officer telling *me* I have to go to the hospital for drug testing? Well, this is where a common misunderstanding occurs. The commander is the *only one* who can direct the toxicological testing. The regulation governing these tests is AFR 30-2, which falls in the social actions officer's domain. However, recent revisions to AFR 127-4, require the *results* of tox testing be included in the safety mishap report under Item 7, "personnel involved." So where does this lead us? When a mishap occurs, the appropriate commanders, supervisors, and safety personnel are notified. For flight mishaps, often the commander and flight safety officer will meet the aircraft for an initial fact finding interview with the crew. It's at this time that the safety officer asks if the commander wants tox testing accomplished. If the answer is yes, then someone must be responsible for transporting the crew to the hospital and informing the flight surgeon of the commander's desire. To the crewmember, understandably, it appears the flight safety officer is the one with an irrational burning desire to have the toxicological test accomplished. The result? Yet another dead messenger? Not really. These tests protect you by proving you were *not* under the influence of drugs when the mishap occurred. Negative test results provide proof that medications or other drugs did *not* have a bearing on the mishap. Your positive support of the program is needed to eliminate unwarranted fears.

1984 MAC Safety

The MAC Trophy for Flying Safety

Presented to the MAC air force or service with the most effective flight safety program as determined by flight mishap rate and severity, mishap causes and mission.

22d Air Force

MAC Flight Safety Achievement Award

Presented to wings and geographically separated units that are accident-free and have an effective flight safety program during the calendar year.

Category One

41 RWRW, McClellan AFB
62 MAW & 446 MAW (Assoc), McChord AFB
63 MAW & 445 MAW (Assoc), Norton AFB
89 MAW, Andrews AFB
314 TAW, Little Rock AFB
374 TAW, Clark AB
375 AAW & 932 AAG (Assoc), Scott AFB
436 MAW & 512 MAW (Assoc), Dover AFB
443 MAW, Altus AFB
463 TAW, Dyess AFB

Category Two

40 ARRS, Hill AFB
71 ARRS, Elmendorf AFB
316 TAG, Yokota AB
616 MAG, Elmendorf AFB

MAC Support Safety Achievement Award

Presented to units designated or functioning as military airlift support squadrons and mobile aerial port squadrons. Units selected must have exceptional quality of services and successful mishap prevention programs.

2 MAPS, Little Rock AFB
3 MAPS, Pope AFB
603 MASS, Kadena AB
619 MASS, Hickam AFB
625 MASG, Torrejon de Ardoz AB
Det 3, 625 MASG, Hellenikon AB

Award Winners

MAC Distinguished Flying Unit Safety Award

Presented to the best unit from among those receiving the MAC Flight Safety Achievement Award.

Category One

62 MAW & 446 MAW (Assoc), McChord AFB

Category Two

40 ARRS, Hill AFB

MAC Safety Officer of the Year Awards

Primary Duty

Mr. Lee W. Moore
436 MAW, Dover AFB

Additional Duty

Capt Joyce B. Richardson
314 SUPS, Little Rock AFB

MAC Safety NCO of the Year Awards

Primary Duty

TSgt Carmen R. Centennial
316 TAG, Yokota AB

Additional Duty

TSgt Harry M. DeSantis
436 FMS, Dover AFB

TMF Instrument Quiz

DISTANCES

METERS/FEET		
MTRS	FT/MTRS	FT
0.305	1	3.281
0.610	2	6.562
0.914	3	9.843
1.219	4	13.123
1.524	5	16.404
1.829	6	19.685
2.134	7	22.966
2.438	8	26.247
2.743	9	29.528
3.048	10	32.808
6.096	20	65.617
9.144	30	98.425
12.192	40	131.233
15.240	50	164.042
18.288	60	196.850
21.336	70	229.658
24.384	80	262.467
27.432	90	295.275
30.480	100	328.083
60.960	200	656.2
91.440	300	984.3
121.920	400	1312.3
152.400	500	1640.4
304.800	1000	3280.8
609.601	2000	6561.7
914.402	3000	9842.5
1219.202	4000	13123.3
1524.003	5000	16404.2

NAUTICAL MILES TO		
KM	NM	SM
0.185	0.1	0.115
0.370	0.2	0.230
0.556	0.3	0.345
0.741	0.4	0.460
0.926	0.5	0.575
1.111	0.6	0.690
1.296	0.7	0.806
1.482	0.8	0.921
1.667	0.9	1.036
1.85	1	1.15
3.70	2	2.30
5.56	3	3.45
7.41	4	4.60
9.26	5	5.75
11.11	6	6.90
12.96	7	8.06
14.82	8	9.21
16.67	9	10.36
18.52	10	11.51

NAUTICAL MILES TO		
KM	NM	SM
37.04	20	23.02
55.56	30	34.52
74.08	40	46.03
92.60	50	57.54
111.12	60	69.05
129.64	70	80.55
148.16	80	92.06
166.68	90	103.57
185.20	100	115.08
370.40	200	230.16
555.60	300	345.23
740.80	400	460.31
926.00	500	575.39
1111.20	600	690.47
1296.40	700	805.54
1481.60	800	920.62
1666.80	900	1035.70
1852.00	1000	1150.78

MTRS	NM
100	0.054
500	0.270
1000	0.540
2000	1.080
3000	1.620
4000	2.160

MTRS	NM
5000	2.700
6000	3.240
7000	3.780
8000	4.320
9000	4.860
10,000	5.399

MILLIBARS TO INCHES

mb	0	1	2	3	4	5	6	7	8	9
	INCHES									
940	27.76	27.79	27.82	27.85	27.88	27.91	27.94	27.96	27.99	28.02
950	28.05	28.08	28.11	28.14	28.17	28.20	28.23	28.26	28.29	28.32
960	28.35	28.38	28.41	28.44	28.47	28.50	28.53	28.56	28.59	28.61
970	28.64	28.67	28.70	28.73	28.76	28.79	28.82	28.85	28.88	28.91
980	28.94	28.97	29.00	29.03	29.06	29.09	29.12	29.15	29.18	29.21
990	29.23	29.26	29.29	29.32	29.35	29.38	29.41	29.44	29.47	29.50
1000	29.53	29.56	29.59	29.62	29.65	29.68	29.71	29.74	29.77	29.80
1010	29.83	29.85	29.88	29.91	29.94	29.97	30.00	30.03	30.06	30.09
1020	30.12	30.15	30.18	30.21	30.24	30.27	30.30	30.33	30.36	30.39
1030	30.42	30.45	30.47	30.50	30.53	30.56	30.59	30.62	30.65	30.68
1040	30.71	30.74	30.77	30.80	30.83	30.86	30.89	30.92	30.95	30.98
1050	31.01	31.04	31.07	31.10	31.12	31.15	31.18	31.21	31.24	31.27

TEMPERATURE SCALES IN DEGREES

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-40	-40.0	-28	-18.4	-16	3.2	-4	24.8	8	46.4	20	68.0	32	89.6	44	111.2
-39	-38.2	-27	-16.6	-15	5.0	-3	26.6	9	48.2	21	69.8	33	91.4	45	113.0
-38	-36.4	-26	-14.8	-14	6.8	-2	28.4	10	50.0	22	71.6	34	93.2	46	114.8
-37	-34.6	-25	-13.0	-13	8.6	-1	30.2	11	51.8	23	73.4	35	95.0	47	116.6
-36	-32.8	-24	-11.2	-12	10.4	0	32.0	12	53.6	24	75.2	36	96.8	48	118.4
-35	-31.0	-23	-9.4	-11	12.2	1	33.8	13	55.4	25	77.0	37	98.6	49	120.2
-34	-29.2	-22	-7.6	-10	14.0	2	35.6	14	57.2	26	78.8	38	100.4	50	122.0
-33	-27.4	-21	-5.8	-9	15.8	3	37.4	15	59.0	27	80.6	39	102.2		
-32	-25.6	-20	-4.0	-8	17.6	4	39.2	16	60.8	28	82.4	40	104.0		
-31	-23.8	-19	-2.2	-7	19.4	5	41.0	17	62.6	29	84.2	41	105.8		
-30	-22.0	-18	-0.4	-6	21.2	6	42.8	18	64.4	30	86.0	42	107.6		
-29	-20.2	-17	1.4	-5	23.0	7	44.6	19	66.2	31	87.8	43	109.4		

1. During an enroute descent, you have been given a QNH of 29.97. The local transition level is FL140. As you pass 15,500 feet the ATC controller directs you to level off at FL150 and return to the holding pattern. You should:
   a. Leave the altimeter set to 29.80.
   b. Reset the altimeter to 29.92.
   c. Request an appropriate altimeter setting from ATC.

2. You are filing for an off-airway route, with a direct route segment defined by points Alpha and Bravo. These points fall outside radar contact and as such are considered:
   a. Compulsory reporting points.
   b. Optional reporting points.
   c. Defined as optional or compulsory by ATC when clearance is obtained.

3. An ATC issued safety advisory, either terrain/obstruction or aircraft conflict advisory:
   a. Requires immediate action by the pilot, unless compliance creates a greater hazard.
   b. Is a fail-safe system of advisories their operating flight rules (IFR or VFR) which, if followed provides a totally safe flight envelope.
   c. Are advisory only. It is the pilot's prerogative to act or not act.
   d. Will include a course of action which will keep the aircraft clear of all traffic airborne.

4. ATC has just read a clearance to you which you can expect in another 30 miles, and you are under IFR in IMC, without an ATC assigned route. It is at this fortuitous moment that all of your two-way communication devices fail. You should:
   a. Head for the nearest airfield and land.
   b. Continue the flight, following the flight planned route you filed before flight.
   c. Continue the flight via the route ATC has advised may be expected in a further clearance.

5. On takeoff, you are instructed to fly runway heading. You are departing runway 24 and experiencing three degrees of right drift. You should fly a magnetic heading of:

a. 237°
b. 240°
c. 243°
d. 060°

6. Under ICAO rules, when operating outside radar contact, in addition to position reports, pilots should, without being specifically requested by ATS, report all of the following except:

a. When vacating one assigned level for a new assigned level.
b. When reaching a new assigned level.
c. A and B above.
d. None of the above must be reported without request.

7. You are flying under ICAO rules in advisory airspace on an advisory route and are about to enter a control area (CTA). You must:

a. Advise the unit providing advisory service of your intent to enter the control area.
b. Do nothing, as you are flying an advisory route and complying with the servicing agencies instructions.
c. Obtain ATC clearance to enter the CTA.

The Answers

1. (b) Vertical position of an aircraft during missed approach will be governed by the same procedures specified for takeoff and climb, enroute, and approach and landing. If descent is stopped above the transition altitude, the altimeter must be reset to 29.92 (QNE) to insure adequate separation between this level and the adjacent levels above and below. (From FLIP GP Chapter 6, ICAO Procedures p. 6-5)

2. (a) Direct: A straight line flight between two navigational aids, fixes, points or any combination thereof. When used by pilots in describing off-airways routes, points defining direct route segments become compulsory reporting points unless the aircraft is under radar contact. (From FLIP GP Chapter 2, p. 2-13)

3. (c) A safety advisory is issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgement, places the aircraft in unsafe proximity to terrain, obstructions, or other aircraft. The issuance of a safety advisory is contingent upon the capability of the controller to have an awareness of an unsafe condition. The course of action will be predicated on other traffic under ATC control. Once it is issued, it is solely the pilot's prerogative to determine what course of action, if any, he will take. (From FLIP GP chapter 2, p. 2-32)

4. (c) If the (radio) failure occurs in IFR conditions, each pilot shall continue the flight according to the following:

a. By the route assigned in the last ATC clearance received;
b. If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance;
c. In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance ; or
d. In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan. (FROM FAR Part 91, 91.127 pp. 37)

5. (b) Runway heading is the magnetic direction indicated by the runway number. When cleared to "Fly/maintain runway heading," pilots are expected to comply with ATC clearance by flying the heading indicated by the runway number without applying any drift correction. (From FLIP GP Chapter 2, p. 2-31)

6. (c) In addition to making position reports, pilots should, without being specifically requested by ATS, report:

(1) When vacating one assigned level for a new assigned level.
(2) When reaching a new assigned level.

7. (c) An advisory route (ADR) is merely a recommended route in uncontrolled, advisory airspace. No control will be offered, but "advice" or "suggestions" will be made to facilitate flights. It is for the pilot to decide and to inform the unit providing this service whether or not he will comply with the advice or suggestions. When flying ADRs, entry clearance into CTAs must still be obtained. (From FLIP GP chapter 6, ICAO Procedures p. 6-2)

The Approach to Landing Will Always Be...

A Critical Phase

As crewmembers, we're well aware of major weather phenomena like thunderstorms hurricanes, and tornadoes. But do we pay less attention to the more common and usually less significant environmental aberrations associated with heavy rain showers? These "minor" weather problems are not normally considered a direct threat to today's airplanes, and are even accepted as a normal consequence of flight. Their effects, however, can be devastating during a critical phase of flight, as an Eastern Airlines crew discovered during an approach to landing.

Eastern Flight 576 from Miami, Florida, to Washington, D.C., had intermediate stops in Atlanta, Georgia, and Raleigh, North Carolina. For this experienced crew it was just another passenger run. The Boeing 727 was responding well and the first leg of their journey was anticlimactic, with a smooth termination at Atlanta.

Later, refueled and loaded with 131 passengers, Flight 576 took off for the Raleigh-Durham airport via the computer-stored IFR flight plan. The flight remained uneventful until arrival in the Raleigh-Durham airport vicinity about 1950 EST, where they were forced to deviate around heavy rainshowers. Circumnavigating these areas proved no problem and the immediate vicinity of the airfield appeared free of heavy precipitation and thunderstorms. Just to be sure, however, the crew tuned in the automatic terminal information service (ATIS) during the enroute descent for landing. The report indicated, in part, a ceiling estimated at 2,000 feet overcast, seven miles visibility and light rain. This confirmed the crew's radar assessment of the terminal weather, and they continued the approach.

Three minutes after the ATIS check, approach control gave the crew a revised weather brief, correcting the weather observation to 1,000 feet scattered, measured ceiling of 2,000 feet overcast, and the visibility now down to four miles. Conditions were deteriorating, but remained well above minimums.

Clearance to land came two minutes later, along with an advisory that a preceding heavy aircraft had experienced "strong wind" from the left with a speed of about 20 knots between 900 feet and 1,200 feet on final. Responding to the advisory, the first officer noted the conditions indicated "quite a storm" was approaching the airfield. The captain was flying the airplane on this ILS approach to runway 23 and intercepted the glideslope at about 1,800 feet MSL. Their landing reference speed was 140 KIAS and the captain maintained approximately 142 KIAS. There were no problems with the airspeed needles bouncing or indicating unstable airspeeds.

Two minutes after approach control passed the advisory, and only four minutes since the crew's last weather update, approach control reported the visibility at the airport to be a mile and three-quarters.

The flightcrew made their altitude awareness calls at 1,000 feet and 500 feet, and at 2001:46 the airplane descended below a well-defined ceiling of 400 feet. The first officer called the sequenced flashing lights in sight. The captain then looked out and picked up the approach lights visually, followed by the runway threshold and the runway lights. Confident the alignment was appropriate for the approach and landing, he mentally committed himself to land.

Unknown to the crew, the local controller and the approach controller began assessing airfield visibility at 2001:42, and at 2002:07 the approach controller said to the local controller, "...visibility three-quarters now."

Flight 576 had experienced light to moderate rain throughout the final approach, and the windshield wipers had been used at the low setting. The captain requested they be reset to high at 2001:49, just after breaking out. Although the rain intensity varied, the crew estimated the visibility remained above one mile throughout the approach. The first officer called the runway in sight at 2001:55, with the aircraft about 200 feet above the runway. The captain, meanwhile, began to increase thrust as he noticed the aircraft slightly below the glideslope. He planned to level the aircraft and reintercept the glideslope.

Five seconds later the first officer stated "looks to be a little low," with the aircraft at about 100 feet AGL and just inside the middle marker. Four seconds later he stated, "rate of descent too high," and he repeated it just two seconds later. The aircraft impacted the ground 282 feet short of Runway 23 only 3.5 seconds later, at 2002:08.5. The aircraft bounced and touched down on the runway, then slid to a stop 4,150 feet beyond runway threshold. The aircraft sustained major damage, but luckily injuries to the crew and passengers were minor.

Analysis

Determining the cause for a short landing out of an instrument approach flown by an experienced pilot who was backed up by an experienced crew in a perfectly functioning aircraft posed a difficult problem for National Transportation Safety Board (NTSB) investigators. This captain had nearly 6,000 hours, as did the first officer. They were both properly certificated and had adequate crew rest prior to flight. The NTSB investigation centered on the final seconds of the approach, as there was nothing odd or significant about the flight before this; specifically, from 2001:55 when the aircraft was last on glideslope, through ground impact 13.5 seconds later.

Analysis and correlation of the cockpit voice recorder (CVR) and the flight data recorder (FDR) revealed a normal, stable approach down to decision height (200 feet for this approach). Prior to that, the aircraft was below glideslope only once, just before the first officer reported the sequenced flashing lights in sight. The aircraft was then 250 feet above runway elevation. At 200 feet, the captain increased thrust because he saw the aircraft was below glideslope. At decision height the aircraft was only five feet below glideslope. The descent rate indicated the aircraft was maintaining a 4.0° glideslope up to this point, and all visual cues to the crew were normal. The first officer called out that the aircraft appeared a little

low to him when the aircraft was 10 to 15 feet below glideslope, but at 2002:00, the rate of descent began to increase rapidly. Four seconds later, with the aircraft less than 100 feet above touchdown, the aircraft was enveloped by a "wall of water." The crew lost all external visual references. The aircraft continued to descend despite the continued advance of power.

Witness and crew statements combined with physical evidence compared to the FDR trace confirmed there was a continued addition of power and a rotation of the aircraft. The trace showed a 5° average flight path angle during the last five seconds of flight, while the physical evidence showed a much flatter 2.5° approach angle at impact. The board established the relative position of the aircraft via CVR and FDR derived information. The runway lights were visible 4 to 6 seconds before impact, all the time available for the pilot to assess the problem, determine corrective action and respond. To further complicate the captain's problem, he had already transitioned outside the aircraft when he suddenly lost all visual references. This would certainly delay his perception of the descent problem. Further, the success of his efforts would be compounded by the aircraft's response time.

Studies on reaction time requirements for pilots in similar situations indicate that

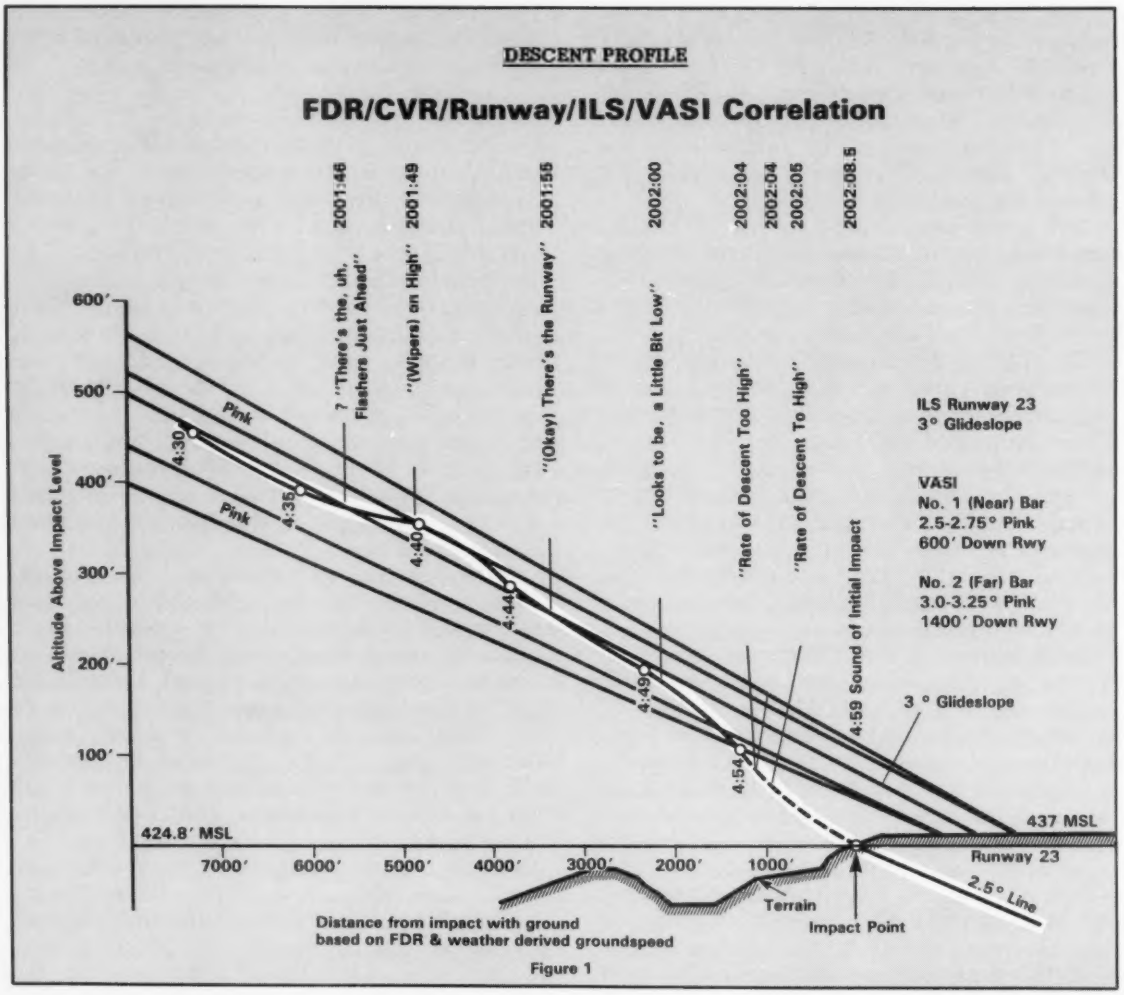


Figure 1

between 2.5 seconds and 3.8 seconds are necessary from event *recognition* to airplane control *movement*. During this time, the aircraft would continue to react to the external forces creating the deviation.

Yet another factor to be considered was the pilot's use of the VASIs for glideslope reference. The aircraft was in rain throughout the approach, even before the torrential downpour. The water on the windscreen caused a downward refraction of light, creating the illusion the aircraft was higher than its actual altitude. Moreover, the VASI system had a not-so-obvious problem. An aircraft can depart the VASI on-glideslope parameters at a descent rate in excess of one thousand feet-per-minute and fly for six more seconds, and the VASI will still indicate *on glide slope*. The aircraft can then fly for three more seconds before a positive low indication is received by the crew.

Conclusions

The conclusions reached by the NTSB provide a clear sequence of events.

- 1. The instrument approach was stable and uneventful until the airplane passed decision height.
- 2. The general weather forecast was substantially correct; however, the localized weather encountered by Flight 576 while on final approach was much worse than was reported on the ATIS.
- 3. Air Traffic Control (ATC) personnel were not aware of the rapidly deteriorating weather conditions in time to warn the flightcrew.
- 7. At about 1957:00, heavy rain moved across the airport toward the runway 23 approach course.
- 8. The weather condition deteriorated rapidly after Flight 576 passed the decision height.
- 9. The aircraft encountered an unexpectedly heavy rain shower with associated downdrafts and horizontal wind shear about 100 feet above the ground.
- 10. The captain observed the descent below glideslope caused by the initial encounter with the heavy rain and responded by adding thrust.
- 11. The flight crew rapidly lost forward visibility when the airplane encountered the heavy rain.
- 12. The rate of descent increased rapidly after the airplane encountered the heavy rain despite the addition of thrust and the upward rotation of the airplane by the captain.
- 13. The captain had less than six seconds to correct the airplane's flight path if he was to avoid hitting the ground.
- 14. There was insufficient time for the captain to react and the airplane to respond to prevent the airplane from striking the ground after the encounter with the heavy rain when the airplane was less than 100 feet above the ground.

Probable Cause

The National Transportation Safety Board determined the probable cause of the accident was an encounter with heavy rain and associated downdrafts and wind shear during the landing phase when the aircraft was less than 100 feet above the ground. The sudden onset of the meteorological conditions did not allow sufficient time for the captain to perceive and react to the effect of the downdraft and wind shear.

Application to MAC

The probability of MAC airlifters making an approach in rain is far from remote; in fact, it is a common occurrence. Weather briefings, ATIS, ATC personnel, airborne radar, and visual inspection could not adequately warn this crew of the strong downdraft they would encounter so close to landing. At the first sign of the approach deviating low on the glideslope, the captain increased power. In fact, it is important to note the crew did everything they could reasonably be expected to accomplish, yet it still wasn't enough. The dynamics of flight close to the ground, as during approach to landing, are much less forgiving than during cruise at altitude. Aside from the tip to be wary when relying on the VASIs for glideslope information, the greatest point gleaned from this accident is that we must always be ready to respond to downdrafts, windshear, microbursts and the like, no matter what phase of flight we're in. (*Editor's Note:*—For an in-depth discussion of windshear, downbursts and microbursts, see *TMF* May and October 83, and May 84.)

Adapted from NTSB/AAR-83/06

Lajes Field, Azores

(Elevation 180 feet)

Lajes Field, 845 miles west of Lisbon, Portugal, is located on the northeast coast of the island of Terceira in the center of the Azores island chain.

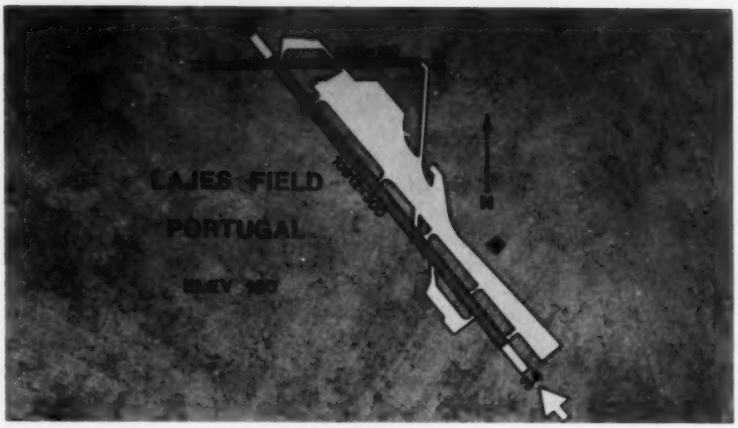
The highest point in the Azores is a mountain 7,713 feet MSL, 64 miles southwest of the field. Terrain in the immediate area exceeds 1,000 feet MSL two and one-half miles southwest. The highest point on the island is a 170-foot tower reaching a height of 3,520 feet MSL located 12 miles west. Circling at Lajes is only authorized east of the field due to high terrain.

Lajes has two runways. Runway 16/34, the primary runway, is 10,912 feet long and 300 feet wide. Both 16 and 34 have High Intensity Approach Lights, VASIs, High Intensity Runway Lights and jet barriers. Runway 11/29 is for emergency use only and is 6,270 feet long and 150 feet wide. Taxiways and the parking ramp are located on the eastern portion of the airfield.

MAC aircrews should consult the 21st Air Force Summary of Airfield Restrictions for Lajes, Azores (LPLA) prior to flying there.

If you note any airfield changes not included in the qualification programs notify your MACAF DOT so they can update them.

—Adapted from ISD-Q6-368



Airfield Diagram

Final approach to runway 34 at 2½ miles.

Final approach to runway 16 at 2½ miles.

C.R. Terror

The Forgetful Flyboy Freezes Up.

"What a day, Boss," Max Torque proclaimed as he loaded his B-4 bag aboard the waiting crew bus.

"Yeah Boss, I'm just glad tomorrow is a free day."

"Absolutely true, m'lads. But at least we finally made it to Paradise AFB. Just think, people eat baloney sandwiches for years saving money to visit this place," C.R. remarked trying unsuccessfully to breathe some life back into his crew.

"What's the local time here anyway?" asked Max.

"It's exactly 00:16 and 38 seconds, local time" piped in Capt. Pinpoint Ficks, the squadron stan-eval navigator. Ficks was flying with C.R., against his better judgment, in order to log his one remaining night "cel" requirement.

"Ah, here's the command post. I'll be right back boys. Sammy, one copy of orders if you please," C.R. requested, his pudgy hand outstretched.

As the Cherub of C 3 approached the barred command post window, he was greeted by a major who looked as though he couldn't have been more than 13 years old.

"Good morning, Major Terror. I'm Maj. Sterling. How was your flight down?"

"Quite long, but well worth the effort, young man," answered the Rotund One as he shifted his position

to avoid light reflections off the young major's silver-plated wings. "We're looking forward to a little sight-seeing tomorrow."

"Well sir, I'm afraid I've got some bad news for you. Colonel Fang called and requested we give you minimum crew rest and send you back to Homeplate AFB. You're legal at 1300 local. Sorry."

"Egads! Did he give any reason?"

"No, sir. He only said that he needed the aircraft back sooner than expected. There's a phone on the wall behind you. If you'd like, you can give him a call yourself."

"No, no, that won't be necessary," sighed the Titan of Tourism.

"Oh, one other thing. Colonel Fang mentioned something about 'launch control officer' for a month if you don't get the aircraft back tomorrow."

"Gadzooks!"

C.R. looked like a deflated tire as he boarded the waiting crew bus. "Well boys, looks as though we'll have to do our sightseeing earlier than expected. We're legal at 1300 local for the flight back to Homeplate."

"What happened, Boss?" Sammy inquired, looking somewhat disappointed.

"The wing needs the aircraft back earlier than expected," C.R. started to explain, "and another aircraft was able to pick up our scheduled load. So we're free to RTB."

The now-depressed crew

didn't utter a sound as the crew bus pulled into the billeting parking lot.

"Here we are m'lads. Let's hit the ground running," C.R. announced, still trying to keep up the crew's spirits.

In short order the crew was "log-sawing" in preparation for the day's activities.

"Sammy, wake up." C.R. spoke softly as he shook the Reposed Right-seater.

"Huh, wha', gear up, what is it?"

"Come on, we're going sightseeing," C.R. continued. In a flash the pair was dressed and out the door.

"What's the plan, Boss" Sammy asked, not having his copy of the sightseeing schedule.

"Just hold on Sammy. I've got a plan to see all the sights in short order," C.R. answered sporting a broad grin. "We're heading for the Paradise Regional Airport."

In no time, the pair found themselves at the portal of "Nick's Rent-a-Plane."

"Good morning, my good man. I'd like to rent a Sniper 140, por favor," the Able Aeronaut spoke in his best baritone voice.

"Have you flown with us before, sir?" asked the lethargic young lineman.

"Yes, of course I have. Besides, I am Major C.R. Terror, USAF heavy airplane pilot."

"Well sir, I need to see your log book and all of your civilian flying documents," the lineman responded, skeptical of C.R.'s qualifications.

"Now see here, young man. I was flying aircraft when you were still eating strained peas. Nick's going to hear about this and you'll regret the day you ever heard the name C.R. Terror."

"Yes sir, I can relate to that already. Go ahead and take 4851WD, but we need it back in an hour. And be careful," the young lineman pleaded, realizing the risk he was taking.

"No problem, young man," the Pudgy Pilot answered as he whisked himself out the door and scanned the tarmac for his chariot.

"There it is over there, Boss," Sammy called, pointing toward the red and white craft.

"Okay, Sammy, help me untie her and we'll be on our way."

"Boss, are you sure you know how to fly this thing?" Sammy spoke, as he felt a twinge in his stomach.

"Sammy," C.R. stated reassuringly, "I've spent many carefree hours and lost many lunches in one of these. Clear prop..." C.R. called turning the Sniper's key to the start position.

The Rhinestone Flyboy looked right at home as he rotated the single engine craft while adding additional right rudder to maintain runway heading. By level-off, Sammy began to relax and enjoy the scenery.

"Look at that view, Boss. Beautiful!" Sammy exclaimed.

Bleeeeeeeep!

"What's that sound, Boss?" Sammy asked, starting to look nervous again.

"Oops...that's the stall warning, buck-o. Nothing to worry about. Just got to get used to the Sniper here," C.R. responded as he lowered the aircraft's nose slightly and added power.

"Boss, are we losing rpm's?"

"Negatory, Sammy," recited the Rusty Major while increasing the power

slightly. "I'm just a little rough on throttle technique. Egads, it's getting late. We'd better head back to Nick's."

As the Perpetrator of Prop-wash approached the airport traffic area, he announced to the world via the VHF radio, "Paradise Tower, this is Sniper 4851WD six miles north requesting a straight-in runway 18."

"Sniper 4851WD you're cleared straight-in runway 18. Report three mile final."

"WD," C.R. answered trying to sound savvy.

"Gear down, Sammy," C.R. called looking like a Roman Emperor giving a "thumbs down" in the coliseum.

"It's *welded* down, Boss," Sammy responded, rolling his eyes upward.

"Oh, yes, just yankin' your chain, Sammy m'boy. Let's see...gear, gas, mixture, fuel pump and c...? Gear's *down*, gas is on *both*, mixture's *rich*, and c...c...c.... What's the bloody 'C' stand for? Oops, getting a little steep. Power coming back.

"Paradise tower, WD, three mile final," C.R. called fumbling with the Sniper's hand-held microphone.

"4851WD you're cleared to land runway 18. Winds are calm."

"WD."

Spudder...sput...sput....

"Boss, what's happening?" Sammy's voice was reminiscent of a bosun's whistle.

"No power, m'lad. We're dead in the water, but I think we can make the runway. Uh, let's see, best glide speed is...? Uh, gas is 'on.' Uh, battery switch is 'on.' Magnetos...uh, yeah." C.R. once again found himself in the cone of confusion.

"We're not going to make the runway, Boss!" Sammy called, the pitch of his voice now reminiscent of a dog whistle. "Flare, boss!"

CA-THUD! The sound of the Sniper hitting the ground was unforgettable. The aircraft came to rest on its belly about 100 yards short of

the runway threshold with the landing gear collapsed and the propeller bent aft.

"We're down, Sammy. Let's get out of here," C.R. called, having enjoyed all the fun he could stand. The Field Grade Fumbler was a blur as he unstrapped and exited the mortally-wounded Sniper.

"Hey Boss, here comes one of Nick's trucks," Sammy proclaimed having regained his voice.

"You guys alright?" asked Nick's brother, J.D., looking down at the crippled Sniper.

"Absolutely, my good man. We're fine despite the fact this engine is apparently ill-maintained," the Gremlin of Grass landings barked, now becoming angry.

J.D. looked into the cockpit and quickly ascertained the problem.

"Looks like someone forgot to use carburetor heat during the approach. Can't tell yet, but you might have had some carburetor ice. Which one of you guys is the pilot-in-command?" He asked calmly.

"I am, er, was" C.R. answered, his face and pate taking on a red tint as he realized what the "C" stood for on the approach checklist.

"Well, the inspector from the local General Aviation District Office wants to talk to you. He also wants to see your pilot's license, your class III medical certificate, your logbook and your restricted radiotelephone operator's permit. Hop in and I'll give you a ride up the hill," replied J.D.

"Egads, Sammy, look at my watch. It's mission show time and we'll never take off on time."

"Boss, who ever would've figured that something so seemingly innocent as this could've had such an impact on the mission?" Sammy asked, looking toward his mentor.

"Sam, *if* Colonel Fang ever lets me fly again, I'll never even leave my Q-room while in crewrest and *if* the FAA let's me keep my license, the first thing I'll do is get some dual instruction.

"Sure, Boss. Sure."

Quick Stoppers

Jet Fueled Headache

Our old friend, JP-4, can have some pretty devastating effects on us if we don't keep our collective guards up. Consider the HC-130 which had departed for some practice pararescue deployments and bundle drops over a local DZ. After the drops, the loadmaster moved forward to his normal flight station. On the way, he smelled some JP-4, notified the pilot, and continued to his flight station where he dutifully went on oxygen. Shortly after that, he told the pilot he had a headache. Throughout this episode, no fumes were ever detected on the flight deck, mainly because of the open ramp and jump doors. Anyway, the AC decided it would be best to terminate the flight and get the loadmaster to a flight surgeon. After a thorough exam by the flight doc and a prescription of aspirin, the loadmaster returned to duty, his headache gone by the end of the day. But what caused the escaping JP-4 fumes?

Seems someone had only tightened the fuselage tank cap *finger tight* instead of using the proper tool. Consequently, the cap came off sometime during the flight due to normal aircraft vibrations.

Hydraulic Hi-Jinks

A crew was hovering an HH-3 while accomplishing some required engine power checks prior to placing the aircraft on alert status. After approximately three minutes of hovering, the Jolly Green's aux hydraulic pressure gauge began fluctuating rapidly and then quickly dropped to zero. The cyclic was displaced to the left and the helicopter began an uncontrollable slide to the left. The AC turned the aux hydraulic system off, regained control of the wayward helo, and landed posthaste. Maintenance personnel found the pressure line from the hydraulic mule panel to the aux hydraulic pump had burst, allowing aux hydraulic system fluid to be pumped overboard. The AC's "heads up" actions prevented what might have become a tragic end to this tale.

Combat Dancing

A foreign country, a camouflaged aircraft, and a crew of steel-nerved professionals summon up images of daring exploits and trying assignments. This particular hostile environment-trained crew was selected for a special task, and they would do it right. Conscious of the importance of the time-sensitive mission, they were determined to get the USO group to the civilian airport in time to catch their connection back to the land of multi-channel television, ASAP. They conveyed their passengers to the aerodrome, deplaned them, then bravely off-loaded their baggage by hand. Returning to their crew positions, they were confident of yet another successful mission, performed superbly under austere (no forklift) conditions. But it wasn't over yet. ALCE directed the aircraft be moved to the "military ramp" to offload the remaining empty pallet and netting. But their way to the military ramp was blocked by another aircraft on the taxiway. Undaunted, the crew quickly elected to combat offload (method B) this critical material. As they started the offload, the nose wheels contacted an obstruction. As the wheels passed over it, the struts began a cyclic extension and contraction. You guessed it! The historically abused ramp skid plate once again kissed the tarmac, sans tenderness, yielding a seven inch "T" shaped puncture in its forward wall. The incident resulted in $3,059.00 damage.

Penciled Out

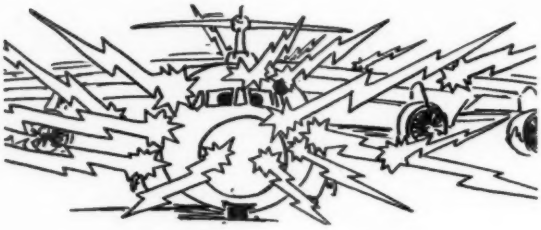
While flying some touch-and-gos in the local pattern, the sixth landing for this C-141 crew turned out to be more than just a little interesting. Actually, the landing went smoothly, but the pilots couldn't advance the throttles beyond idle power. Chalk up one rejected takeoff for the crew. That was the bad news. The good news was that the throttles did go into the reverse range and the engines followed suit.

After a thorough going-over, the maintainers found a regulation U.S. Government mechanical pencil on the bulkhead directly beneath the throttle quadrant. Wear marks on the pencil indicated it had been inside the throttle quadrant for some time!

Strange Formation

While in the local pattern on a visual approach, the crew of this typical four-engine MAC aircraft looked off their right wing and saw a seagull maintaining what appeared to be a fairly tight fingertip formation. Apparently, the seagull's ego got the better of him, and he tucked in a little too close. Alas, while trying to assume the lead he ended up getting sucked into the number-three engine. Damage to the engine was significant, but not quite as bad as that sustained by the seagull.

Quick Stoppers



Strange Happenings... of the Electronic Type

File this one under the heading of "could not duplicate." While on a one-time flight with the gear down and navigating via the INS only (as in out of VOR and TACAN range) in solid IMC, this particular C-141's number-four generator-out light illuminated. The engineer duly checked the freqs and volts, found none, and summarily disconnected the generator, also turning off some unnecessary electrics in the process. About 1½ hours later, the three remaining engine-driven generators indicated out, and the emergency power-on light illuminated. Sure enough, numbers one, two and three generators showed no freqs or volts, and some more non-essential equipment was turned off. By now, the crew was becoming a tad anxious, and decided to return to their departure field. After turning around, and since their fuel supply was running low because of dragging the gear around, they depressurized the aircraft, and raised the gear. Well, wouldn't you know it! While repressurizing the aircraft, the number-one generator suddenly started showing freqs and volts, and was used to repower some of the electrical system. Approaching their departure base, the crew depressurized the Starlifter, lowered and pinned the gear, then completed a normal landing.

After a series of exhaustive engine runs, the maintainers couldn't find anything wrong! Not one thing! Could not duplicate! Just to be on the safe side, though, the aircraft was confined to the local traffic pattern for a while, "just in case," and was eventually cleared to fly normal MAC line missions.

Near Miss of the Third Kind

There you are on short final when the IP suddenly calls, "go around, truck on the runway." But how many of us have ever seen that "truck." Don't laugh, friends, because it's happened—again.

Cleared for a night landing on a helipad, the HH-3 was about 80-100 feet in the air when, from out of nowhere, an unlit vehicle appeared on the scene, traveling at an excessive speed. "Go around," came the call, and the Sikorsky took an unplanned trip around the VFR pattern.

The ensuing investigation revealed the vehicle was driven by a licensed, flightline certified civilian who worked on the base. Seems he was driving with the vehicle's parking lights on and the headlights off, but thought (in other words, *assumed*) his rotating cab-mounted beacon was on. It wasn't, to say the least. When he heard the unmistakable sound of a helicopter and saw its landing lights coming directly for him, he did the only thing he could under the circumstances. He "floored" the accelerator and made haste to vacate said helipad. In the end, the driver's ramp license was revoked, and all of the people in the maintenance section where he worked will attend a flightline driving seminar.

After Deadlines

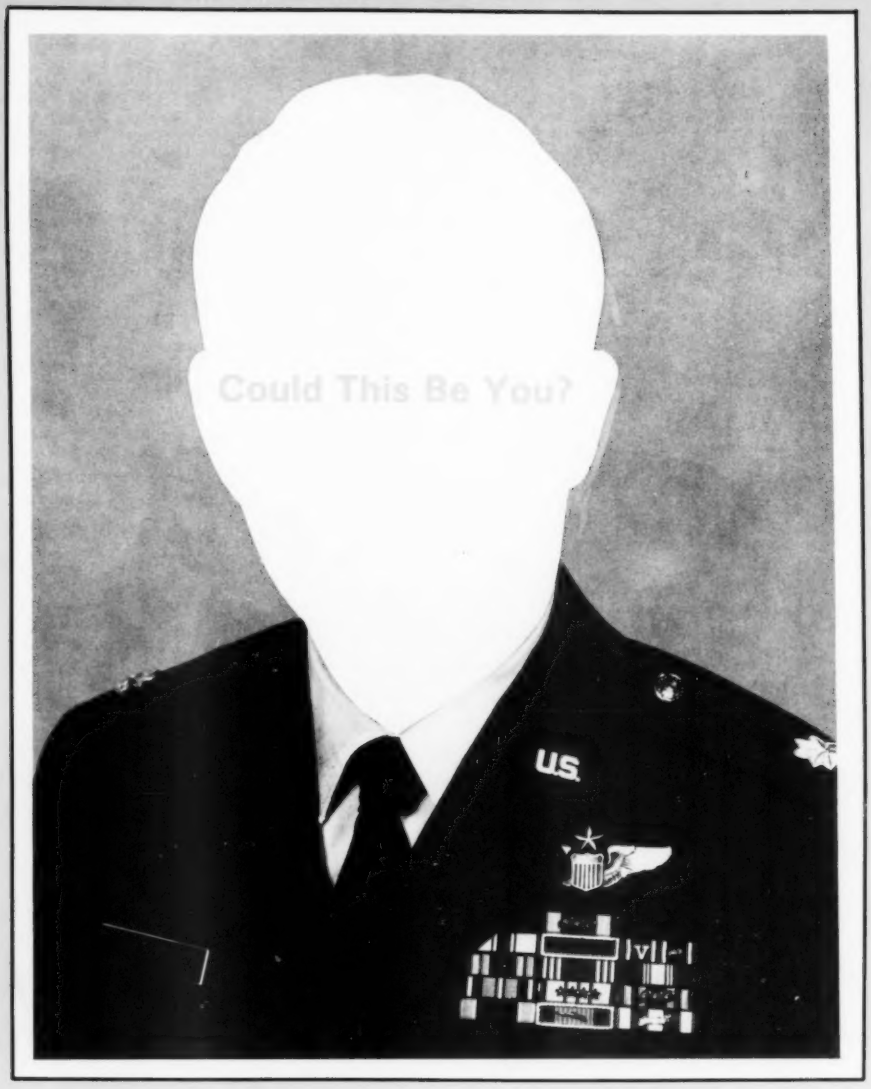
TWO C-130 MISHAPS IN JANUARY—On 22 Jan, an AFRES C-130A from the 440th Tactical Airlift Wing, General Mitchell Field, Wisconsin, crashed off the coast of Trujillo, Honduras. The aircraft was flying a Volant Oak support mission. All 21 people aboard were killed in the mishap. On 29 Jan, a C-130E from the 317th Tactical Airlift Wing, Pope AFB, North Carolina, ran off the runway on landing at Cape Romanzof AFS, Alaska. There were no injuries, but the aircraft suffered extensive damage. Both mishaps are currently under investigation.

438th MAW AIRCREW PARTICIPATES IN FAMINE RELIEF—A C-141 aircrew from the 438th Military Airlift Wing at McGuire AFB, N.J., flew the first U.S. military aircraft used in Ethiopian famine relief efforts. The crew, from McGuire's 6th Military Airlift Squadron, flew two C-141B Starlifter missions to Kassala, Sudan, where more than 122,000 refugees crossed the Ethiopian border. Making two shuttles, the crew delivered tents, water, blankets, dried milk and vegetable oil to the famine victims.

INSTRUMENT QUIZ ERRATA, CHANGE 1—After taking our phones off their hooks and delving back into the innermost recesses of AFM 51-37, the *TMF* editors discovered why all the ire directed at our February "Instrument Quiz." Concerning all of your inquiries about questions two and five on page 11, we herewith correct our miscues. In question two, the correct answer is "c," not "a" as we indicated. For question five, the right answer is "a," not "b." The correct answers are found in AFM 51-37, paragraph 6-7. We appreciate your questions and comments on any article you see in *The MAC Flyer*, and urge all our readers to keep in touch. Write us in care of Editor, *The MAC Flyer*; HQ MAC/IGFE; Scott AFB, IL. 62225-5101, or call us at Autovon 638-3534.

C-22A ENTERS THE MAC INVENTORY—Military Airlift Command recently accepted the Air Force's only C-22A, a modified Boeing 727. MAC acquired the aircraft from the Federal Aviation Administration at no expense. The C-22A's home base is the 310th Military Airlift Squadron, Howard AB, Panama. The unit uses the C-22A in distinguished visitor airlift for support of the commander in chief of the Southern Command. Equipped with an extended-range fuel system, the aircraft can fly non-stop from its home base to the Washington, D.C., area. In addition, it can fly unrefueled to any area in USSOUTHCOM.

☆ U.S. GOVERNMENT PRINTING OFFICE: 746-016/12



THE MAC Flyer

Do you have latent supervisory tendencies? Ever get the urge to tell a story with a mishap prevention punch line? Be embarrassed no more!! These same personality quirks can now actually be considered strengths. That's right! If you are ambitious and can tell a good story, are a relatively new or underutilized major with MAC strategic airlift experience, you are what MAC's flight safety journal needs. We'll have an opening in the May-June 1985 time frame for a supervising editor. Flight safety and/or public affairs experience is a plus. Also helpful is the ability to control and direct the energy of two junior editors. Interested officers should contact Major Jim Lee, Supervising Editor, Autovon 638-5542, or write HQ MAC/IGFE, Scott AFB, Il. 62225-5101.